

OSSIPEE LAKE REPORT

DIVERS FAVORED TO CONTROL SPREAD OF VARIABLE MILFOIL

Key Dates:

- **Wednesday, October 6:** Joint public hearing by NHDES and Army Corps of Engineers on the proposed Mount Whittier racetrack. K.A. Brett School, Route 113, Tamworth. 7 PM.
- **Saturday, October 9:** Meeting of the Ossipee Lake Dam Authority to seek public input on managing the height of the lake. Ossipee Elementary School, Center Ossipee. 9 AM.
- **Sunday, October 10:** Annual fall meeting of members of Berry Bay Association. Giles home, 56 Berry Bay Rd., Freedom. 9 AM.

Teams of divers are set to replace aquatic herbicide as the weapon of choice against variable milfoil, the fast-growing invasive plant that threatens Ossipee Lake in multiple locations.

At a series of meetings arranged by Ossipee Lake Alliance in September, commercial diver Cliff Cabral of Brownfield, Maine, outlined to Freedom town officials his proposal to hand-pull the invasive weeds from Danforth Pond, one of the infested sites. If the plan is approved, divers could start work as early as this month.

While hand-pulling milfoil is time-consuming, it can be a successful control method under the right conditions, according to June D’Andrea, the Alliance’s exotic species program coordinator.

“The composition of the lake’s sediment is



Large mass of exotic variable milfoil fills the swimming area of a property on Danforth Pond. Divers are likely to be used to hand-harvest the invasive weed to control its spread. *Alliance Photo*

always a consideration, but ensuring that the plant is pulled out by the root and small fragments are caught and removed from the lake are the most important parts of the treatment,” she says. “Skilled divers can do the job.”

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ON THE LEVEL: NOTES ON MANAGING THE HEIGHT OF THE LAKE

By Robert Smart

Most of us are familiar with the seasonal ups and downs of the lake’s water level, yet there is still confusion about why such adjustments are needed and who manages them. A little natural history is a good starting point for an explanation.

Thousands of years ago when the glacier that

covered the Lakes Region was molding the landscape, it created 73 natural lakes and ponds in the Carroll County area. Excluding Lake Winnepesaukee, Ossipee Lake is the largest and Conway Lake is next. The completed project resulted in major rivers that drained the area: the Saco, which drains the northern third of the area, and the Bearcamp River-Ossipee River system that drains

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NOTES ON MANAGING THE HEIGHT OF OSSIPEE LAKE

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the remaining two thirds. In addition, there is significant flow into Ossipee Lake from the south through the Pine River, which runs under Route 25.

This natural excavation project was followed by three distinct periods of ice buildup and an eventual melt down, called post-glacial time, during which there were significant water flows through the river drainage systems. This large volume of water also moved significant quantities of sand, gravel and clay into the flow areas.

Outflow from Ossipee Lake has always been at the southeast corner of the lake, into the bays and the Ossipee River and thence through Maine before being discharged into the Atlantic Ocean. The present channel into Broad Bay is the third generation, with the first two channels having been to the southeast and flowing into Leavitt Bay.

Human Intervention

The Ossipee River channel begins a short distance to the west of the Effingham Falls Bridge where the control dams are located.

The dam complex was constructed in 1919 by Central Main Power Company to manage the flow of water into the river. By raising the lake approximately 11 feet above its previous level, the utility was able to charge a fee to downstream businesses for ensuring that they would always have an adequate flow. When the market for this service dried up, they sold the dam to New Hampshire.

The north segment of the dam is made of solid concrete and has a spillway height of 405.0' above sea level. A series of removable horizontal boards can bring the water height to 407.25'. The south segment, also made of concrete, has six gates, five of which are adjustable so that the flow can be



One of two sections of the Ossipee River dam, which has controlled the height of the lake since being constructed in 1911. *Alliance Photo*

fine-tuned to compensate for rain-induced changes in the level.

Separating the two structures is a small wooded island that extends several hundred feet downstream to form an enjoyable area for hiking and fishing.

Management of the dam is a joint responsibility of the Ossipee Lake Dam Authority (OLDA), which is funded by Freedom and Ossipee, and the Dam Bureau of the NHDES Water Division. Decisions on when to open and close the gates are made by the Dam Bureau with actual work and on-site supervision provided by OLDA.

During the 1950s and 1960s the lake level was maintained at 406' during the summer. Then, for recreational purposes it was raised to 407.5'. The State Fish and Game Department noted silting problems developing, however, so the present plan, published in 2000 by the Dam Bureau, was established. It calls for lowering the lake to 404.5' for the winter and raising it to 407.25' for the summer.

The reason for lowering the lake in the fall is to avoid flooding and ice damage during the winter. In the event of heavy rains and melting snow, ice conditions would not allow the dam to be opened or the top boards

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The Alliance is a member of the New Hampshire Lakes Association.

DIVING FOR MILFOIL IS THE NEXT CHAPTER FOR LAKE

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The Alliance invited Cabral to make a presentation to the town based on his track record on Sebago Lake. Working for Maine's Department of Environmental Protection, Cabral and two other divers spent three days on the lake clearing out a number of infested areas.

Karen Hahnel, Maine's invasive aquatic species specialist, confirms that the Sebago Lake treatment was successful. She says that more than a year later, none of the sites treated by Cabral has shown significant regrowth.

The idea of using divers as a control method for Ossipee Lake surfaced this summer after chemical treatments failed to stop the advance of milfoil in Phillips Brook at Leavitt Bay.

In June, the New Hampshire Department of Environmental Services treated Phillips Brook with Diquat, an aquatic herbicide primarily used in lakes where wells are located close to the shore. Although the weeds turned brown and died, a new crop appeared just weeks later and clogged the area once again.

"The only chemical that will kill the plant roots is 2,4-D, and we can't use it because it could penetrate ground soil and infiltrate wells," says D'Andrea, whose home is adjacent to Phillips Brook.

She says that Phillips Brook was dredged in the 1970s and milfoil thrives in lake bottoms that have been disturbed. Since the herbicide did not kill the plant roots, they simply started growing again.

"An aquatic herbicide like Diquat, also known as Reward, is a compromise treatment. Sometimes it works and sometimes it doesn't. That's why we need to look at an alternative control method like diving."

Invasive non-native variable milfoil, which is distinct from beneficial native milfoil, is being spread from lake to lake in New Hampshire where it threatens the environment, the quality of recreation and property values. Since it cannot be eradicated, it must be controlled with chemicals or by hand.

Milfoil was likely introduced to Ossipee

Lake in the early 1990s by boats carrying it from an infested lake. In the past 10 years, the state has documented infestations in Danforth Pond, Danforth Brook, Phillips Brook, and western Leavitt Bay.

This summer, new infestations were confirmed in lower Danforth Pond and the Ossipee River near the Effingham Falls Bridge. The weeds in lower Danforth will be harvested by divers, and the state has already covered the Ossipee River mass with mats called bottom barriers, which are used to smother weeds in relatively contained areas.

Both of the new discoveries were made by volunteers participating in the Alliance's Weed Watchers program, which was launched in May.

Controlling milfoil is expensive, whichever method is used. The state has a fund that pays for a portion of the initial treatments, but towns are on the hook for all of the ongoing expense of treatments once the weeds return.

At this year's town meetings, Ossipee and Freedom residents voted to create funds to pay for control methods. Freedom's fund will likely be tapped this year to pay for part of the Danforth clean-up. Susan Marks, the Alliance's development director, thinks the town is on the right track.

"Given the state's position on funding, milfoil control is on its way to becoming an annual line item in the town budget that is as common and necessary as maintaining the roads."

The stakes are high. Ossipee and Freedom officials estimate that more than 60% of their towns' tax revenue comes from non-residents, mainly waterfront property owners. State studies have found that milfoil can reduce lake property values by 20% - a number that many who have seen dense infestations first-hand think is too conservative.

Later this fall, the Alliance plans to announce a new program to increase the involvement of the owners of the lake's more than 20 boat ramps, according to Marks.

"So far, our focus has mainly been on control. Now we need the help of town officials and boat ramp owners to prevent milfoil from coming into the lake in the first place."

"Pulling the weed out by the root and capturing any fragments that break off are the most important elements of hand-harvesting. Skillful divers can do the job."



Volunteer Craig Niiler collects water samples with a state specialist for the Alliance's 2004 Water Quality Monitoring Program. *Alliance Photo*

ALLIANCE WEED WATCHERS PROGRAM IN HIGH GEAR

Reprinted by courtesy of the Carroll County Independent.

By Terry Leavitt

When June D'Andrea goes down to the dock at her home on Ossipee Lake's Leavitt Bay, she pauses before she gets into her boat to scoop up handfuls of milfoil that dot the shore, hoping to snag a few of the weeds before they can take root.

She does this almost casually, and notes that pieces of the plant wash up on her shore all the time.

Variable milfoil is an exotic plant that has been invading bodies of water in New England (as well as elsewhere in the country). It likes shallow, sunlit places, and can grow up to 24 feet long.

"They look like green feather boas under the water," said D'Andrea, who coordinates the Alliance's Weed Watchers program on Ossipee Lake.

The state Department of Environmental Services has developed the Weed Watchers program to help people look for variable milfoil and other exotic plant species on New Hampshire's bodies of water. Variable milfoil is the only exotic plant that has been found on Ossipee Lake.

With no natural enemies in this region, once the plant takes root in a body of water it can take over, pushing out native plants and animals, and making swimming and boating nearly impossible.

Phillips Brook

That is what is happening on Phillips Brook, near where D'Andrea lives. There, the living feather boas seem to have covered entire sections of the river. People with homes along the channel cannot easily move their motorboats in and out from their own docks without chopping up bits of the plant with their propellers.

On a visit around the neighborhood last week, D'Andrea chatted with residents



June D'Andrea, the Alliance's exotic species program coordinator, checks on the variable milfoil that was found this summer in the Ossipee River. *Alliance Photo*

about what can be done to remove the weed, and she picked up news of a sighting in another part of the lake, one where so far none has been found.

Over the past few months D'Andrea has become an expert on variable milfoil. She can distinguish it from the milfoil and bladderwort species that are native to the area. She knows where milfoil has been found on Ossipee Lake, and she can tell her neighbors how they can help stop its spread.

Alliance Started Program

Ossipee Lake Alliance brought the Weed Watchers program to the lake at the beginning of the summer, with an informational meeting to tell people about the problem and look for volunteers to help find the milfoil.

"That was our first indication there was a broader awareness," said David Smith, of Ossipee Lake Alliance.

Smith said D'Andrea, has been instrumental in getting the Weed Watcher's program running.

"She's so energized and motivated," he said. "I really think she represents the best in the concept of volunteerism."

About a half dozen dedicated volunteers

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MILFOIL IN OSSIPEE RIVER IS PROGRAM'S FIRST DISCOVERY

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who check sections of the lake for milfoil came out of that program. But D'Andrea said more are needed to cover the whole lake. Volunteers should be able to check a specific section of the lake once a month and call in their findings to D'Andrea. With enough volunteers checking the area, the work would not take too much of any one person's time.

Greater Involvement Needed

Another thing D'Andrea said needs to be done is to make sure the many private associations, campgrounds, summer camps, marinas and the more than 25 boat ramps on the lake are involved in the program.

"Unless we reach those, we're never going to get our arms around true prevention," D'Andrea said.

She talks to associations on the lake and answers calls from people who think they've found it. Sometimes they are right. Sometimes not.

People have called from Cassie Cove, she said, and she has gone to check out the plant there. "It's native. It's fine," she said.

The plant was first noticed in the Broad Bay region of the lake about 10 years ago. It has also been found on Upper and Lower Danforth Ponds and in the river between Danforth and Broad Bay, and is spreading north up a brook toward Huckins Pond, as well as being found on Phillips Brook. From the brook, it is making its way into Leavitt Bay.

But D'Andrea said it is impossible to know for certain where the infestation started, and the important thing at this point is for people who live on the lake to work together to bring it under control.

Ossipee River Discovery

One of the most surprising locations where the plant has been found is Ossipee River, just downstream from the dam. That



Alliance director Susan Marks installs one of the state's new signs advising boaters how to prevent the spread of the exotic variable milfoil that is found in Ossipee Lake. *Alliance Photo*

area is small enough that it may be possible to cover the plant with Benthic mats and smother it.

As yet, the plant has not been found on the big lake, or in the channel between Leavitt and Broad Bays.

"We've looked pretty carefully on the big lake and on Pine River. There are a lot of weeds up there, but not variable milfoil," Smith said.

Control Methods

One problem with milfoil is that it has proven nearly impossible to eradicate. So, once it is established, efforts focus on controlling its spread and trying to minimize its presence. Various methods of control have been tried over the years, including chemical treatments, pulling the weed by hand, covering it with mats, and drawing down the lake.

In Phillips Brook, a chemical application was tried last year. It was hoped the treatment would keep the plant out of that section of the lake for one to three years.

D'Andrea said, "Four weeks later it was back in full bloom." In Danforth, which was treated two years ago, residents have also seen the plant return.

"People who live there look at it regularly. They were quite surprised when this year it

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DAM PLAYS IMPORTANT ROLE IN TIMES OF FLOODING

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on the north side to be removed safely.

Flood Control

The limits of human intervention are tested regularly on the lake. A case in point occurred in December, 2003 when the lake level was down and there was a thick sheet of ice. Substantial rainfall on top of heavy snow caused the water to rise to over 407' feet. The dam was open but the level remained high for several days and the ice sheet blew into dock structures and other objects along the shore.

There have been significant floods in recent times during the summers of 1969, 1976 and 1998. From June 13-15, 1998 the area received 17.48" of rain. In a time period of three days, the lake level reached 413' and remained at that level for several days and over the normal level for more than a week. At its peak, the flow rate was 21 times greater coming in than going out. The Ossipee River is the only way out and flow rate is controlled by size of the channel.

The state and federal government have gauges on the Bearcamp and Ossipee rivers that measure flow rate. The state has a gauge that measures the lake level near Westward Shores on the northwest end of the big lake. Readings from these gauges and predicted weather conditions are monitored by the Dam Bureau each day and are used to determine if the dam should be adjusted.

As recently as this past August the lake level was at 407.1' and predictions were for heavy rains from two hurricanes. That morning a decision was made and action taken to open two gates on the south section. Actual rainfall amounts in the area were being monitored to determine what and when further action should be taken.

For 85 years the Ossipee River dam has played a significant role in the life of the lake, and the current state and local plan for manag-



Water flows from the big lake through the bays and empties into this narrow Ossipee River channel, southeast of Berry Bay. From here, it flows through Maine to the Atlantic Ocean. *Alliance Photo.*

ing the lake's level is a good one. Even so, human intervention can only do so much. When nature decides to dump on the area, the lake level will go up and stay up until the drainage system created by the glacier can bring the level back to normal.

Freedom resident Robert Smart is president of the Freedom Community Club and North Broad Bay Association.

Hellquist Named to Ossipee Lake Alliance Board of Directors

Barre Hellquist has joined Ossipee Lake Alliance's Board of Directors.

Hellquist is Professor Emeritus of biology at Massachusetts College of Liberal Arts in North Adams, Massachusetts, and his interests include aquatic invasive plants. He is co-author of "Aquatic and Wetland Plants of Northeastern North America," considered to be the most comprehensive manual and illustrated guide of its kind.

"Barre and his family have been a part of the Ossipee Lake community for more than 60 years," said Alliance executive director David Smith, "and we are thrilled to have him join us. His background and expertise will be invaluable to our efforts."

Some Dam Facts:

- There are 4,400 registered dams in the state.
- 219 dams are maintained by the state's Dam Bureau.
- There are 13 dams in Freedom.
- Ossipee Lake Dam Authority was formed in 1992.
- Effingham voted not to be part of the Ossipee Lake Dam Authority.
- More information may be found online at: www.des.state.nh.us/dam



The view from the Ossipee River Dam, looking northwest. *Alliance Photo*

VOLUNTEERS STILL NEEDED FOR ALLIANCE WEED WATCHERS

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suddenly expanded,” she said. “It was just amazing to me it had gotten so out of hand before people knew what it is,” she said.

Use of Divers

D’Andrea believes pulling up the plant by hand is the most effective method. But to do that properly requires training. The best way to hand pull is by diving with scuba gear. That gives the diver time on the bottom to carefully loosen the soil around the roots and completely pull them out. “It’s a delicate process,” she said, but a critical one.

When professional divers come in to work on a section of lake, they bring nets as well to prevent pieces of the plant from floating away. Ossipee Lake Alliance is looking at having professional divers come and work on the lake.

Meanwhile, D’Andrea and other volunteers are doing what they can to identify new locations and remove the plant safely. She is also happy to talk to people who want to try to clear out patches of the plant in front of their homes. Again the important thing is to pull up all of the roots and to make sure to collect all the pieces.

Like the legendary hydra, chopping off the head of this plant only makes things worse. Two tendrils will sprout from a section that had only one. And even the tiniest bits that don’t get pulled out of the water can float away and take root again and grow, starting a patch in a new location. Spreading seems to be what the plant does best.

Anyone interested in volunteering or learning more about milfoil or the Alliance Weed Watchers program can contact June D’Andrea at (603) 539-1643.

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